INDEX

Acetylcholine, action on hippocampal neurons 366
Acetylcholinesterase, abandoned synaptic gutters in muscle 253
Acromegaly, role of somatostatin 86
Activity, effect of fenfluramine 24
Adaption, locus coeruleus neuron activity 189
Adenosine, cardiovascular effects 319–349
  in body fluids and tissues 321
  clinical implications 343
  exogenous, effects of 330
  formation during ischaemia and hypoxia 325
  quantitation 320
  receptor antagonism 324
  uptake inhibition 321
Adipose tissue, reactive hyperemia, adenosine 329
Aging, synaptic remodelling 262, 267, 268
Alzheimer's disease, somatostatin in brain 88
γ-Aminobutyric acid, role in kindling 6
γ-Aminobutyric acid — somatostatin colocalisation in brain 69
Amygdala
  cell response to odors 231
  kindling 3, 5
Anaesthesia, myocardial blood flow and metabolism during 335, 344
Angina pectoris, adenosine formation 325
Anorexia, fenfluramine induced 21
Apneusis 103
Appetite suppressant 13–62
Arousal, locus coeruleus neuron activity 187
Asthma, role of adenosine 341
Atrioventricular conduction, role of adenosine 336, 343
Auditory stimuli, locus coeruleus neuron activity 186

Behaviour
  locus coeruleus neuron activity 185
  effect of somatostatin 84
Behaviour modification, fenfluramine and weight loss 19
Blood flow
  cerebral, effect of adenosine 337
  myocardial, effect of adenosine 335, 344
  skeletal muscle, effect of adenosine 341
Blood pressure, effect of adenosine 344
Body temperature, effect of fenfluramine 38
Botzinger complex respiratory neurons 106, 114
  late-peak expiratory neurons 162
Brain, adenosine formation during ischaemia 327
Brain stem, electroresponsive properties of isolated neurons 362
Bursting cell
  electroresponsive properties 358
  kindling 3

CA1 pyramidal cell
  electroresponsive properties 353
  effect of transmitters 366
CA3 pyramidal cell, electroresponsive properties 354
Carbohydrate intake, effect of fenfluramine 30
Carbohydrate metabolism, effect of fenfluramine 37
Carbon dioxide, expiratory cell discharge 156
Cardioplegia, adenosine formation 327
Carotid occlusion, adenosine formation 327
Catecholamines, role in kindling 6
Caudate nucleus retroambigualis 150
Centroposterior area of orbitofrontal cortex
  electrophysiology 218, 227
  olfactory nerve pathways 211
  olfactory representation 207
  transthalamic olfactory pathway to 209
Cerebellum, electroresponsive properties of isolated neurons 360
Cerebral blood flow, effect of adenosine 337
Cerebrospinal fluid, adenosine in 321, 327
Chemoreceptors, interaction with respiratory neurons 119, 134, 155
Cholecystokinin 311
Cholinergic–somatostatinergic innervations in cortex 88
Compensatory feeding behaviour 306
Conditioned taste aversion 304
  effect of fenfluramine 31
Coronary graft occlusion, effect of adenosine 343
Coronary steal 335
Corticotropin-releasing hormone, fenfluramine-stimulated release 39
Cranial nerves 115, 134, 155
  taste 294

Deep cerebellar nuclei cells, electroresponsive properties 361
Dementia, somatostatin in brain 88
Development
  somatostatin-containing neurons 70
  synaptic remodelling 262, 267
Diazepam, locus coeruleus neuron activity 190
Diet selection, effect of fenfluramine 20, 30
5,6-Dihydroxytryptamine, fenfluramine anorexia 46
Dipyridamole, effect on adenosine levels in man 323
Disinhibition hypothesis of kindling 5
Dopamine
  antagonist action of fenfluramine 49
  effect on hippocampal neurons 367
Dorsal horn neurons, electroresponsive properties 364

Early-burst inspiratory neurons 142
Energy wasting, effect of fenfluramine 37
Environment, locus coeruleus neuron activity 189
Epilepsy model, kindling mechanisms 1–12
Expiratory neurons 151, 162

Fast spiking cell, electroresponsive properties 358
Feeding and taste 293–317
  gustatory anatomy of the rodent 294
  gustatory involvement in feeding 300
  gustatory neural code 296
Fenfluramine
  behavioural effects
    acute anorexia 21
    conditioned taste aversion 31

diet selection 30
discriminative stimulus properties 32
free feeding and tolerance to weight loss 26
obese rodent model 29
tolerance, cross-tolerance and set point 24
central mechanisms of action
brain 5-hydroxytryptamine 40
dopamine 49
5-hydroxytryptamine-depleting lesion 46
5-hydroxytryptamine receptors 44
mechanisms of decreased 5-hydroxytryptamine levels 41
noradrenaline 50
opioids 50
peptides 51
clinical observations 18
metabolism 15
peripheral actions
carbohydrate metabolism 37
gastric emptying and intestinal motility 32
gastric inhibition mechanism 34
gastro-intestinal 5-hydroxytryptamine 36
lipid metabolism 38
metabolic rate 37
pituitary–adrenal axis 39
structure 14
Food intake, effect of fenfluramine 20
Frog
abandoned synaptic gutters 253
growth and age effects on synaptic remodelling 265
nerve sprouting and synapse formation 258

Gastric distension, taste 308
Gastric emptying, fenfluramine effects 32
Glossypharangeal nerve, taste 308
Glucose
modulation of somatostatin release 74
taste 309
Graft occlusion, adenosine effects 343
Granule cells, electroresponsive properties 355
Growth, synaptic remodelling 262, 267
Growth hormone, modulation of somatostatin release 73
Gustatory anatomy of the rodent 294
Gustatory involvement in feeding 300
Gustatory neural code 296

Heart
adenosine in 321
adenosine formation during ischaemia/hypoxia 325
clinical implications of adenosine 343
metabolism during anaesthesia, effect of adenosine 335
Hippocampus
electroresponsive properties of isolated neurons 352
role in kindling 2, 5
effect of transmitters on neurons 365
Hunger, effect of fenfluramine 19
Huntington's disease, somatostatin in brain 87
5-Hydroxytryptamine
in brain, effect of fenfluramine 40
effect on CNS neurons 367
gastrointestinal, effect of fenfluramine 36
5-Hydroxytryptamine-depleting lesions, effect of fenfluramine 46
5-Hydroxytryptamine receptors, effect of fenfluramine 44
Hypercapnia, expiratory cell discharge 156
Hypotension, effect of adenosine 330
Hypothalamic fibres, projection to prefrontal cortex 203
Hypothalamus, somatostatin secretion 70
Hypoxanthine
formation during brain ischaemia 328
release from heart during angina pectoris 325
Hypoxia, adenosine formation 325

Immunohistochemistry, somatostatin 66
Inferior olive, electroresponsive properties of neurons 362, 367
Inosine monophosphate, in skeletal muscle during ischaemia 328
Inspiratory neurons
early-burst 142
late-peak 107, 126
upper cervical 167
Insulin, taste 309
Intestinal motility, fenfluramine effects 32, 35
Ischaemia, adenosine formation
brain 327
heart 325
newborn infants 329
skeletal muscle and adipose tissue 328
Isolated brain preparations 352

Junctional modelling 252, 262

Kidney, effect of adenosine on function 337
Kindling
disinhibition hypothesis 5
epileptic neuron hypothesis 2
synaptic potentiation hypothesis 1
working hypothesis 9

Late-peak expiratory neurons 151, 162
Late-peak inspiratory neurons 107, 126
Lateral hypothalamic area
cell response to odors 243
olfactory pathways to 236
Lateroposterior area of orbitofrontal cortex
electrophysiology 217, 226
neural pathway to 199
olfactory area in 198
olfactory nerve pathways 211
Learning, locus coeruleus neuron activity 189
Limbic lesions, kindling 5
Lipid metabolism, effect of fenfluramine 38
Locus coeruleus neurons
electroresponsive properties 363, 367
single unit activity in behaving animals 183–194
Long-term potentiation 2
Lung, effect of adenosine 341
Lung inflation, neuronal determinants 115, 134, 155, 169

Meal patterns, effect of fenfluramine 26

Medulla, respiratory rhythm generation 101
Metabolic rate, effect of fenfluramine 37
N-Methyl-D-aspartate, effect on CNS neurons 367
Monkey(*Macacca irus*), olfactory nervous system 195–250
Morphine, locus coeruleus neuron activity 190
Motor endplate disease, synaptic remodelling 274
Multiple innervation 282
Muscle, skeletal
  adenosine in 321
  adenosine effect on blood flow 341
  adenosine formation during reactive hyperemia 328
  aging 269
  multiply innervated 282
  synaptic remodelling 252, 265
Myasthenia gravis, synaptic remodelling 274

Neocortex, electroresponsive properties of isolated neurons 356
Neocortex, olfactory area
  cat 244
  dog 242
  monkey 198, 205, 214
  rabbit 239
  rat 246
Neocortex, olfactory nerve pathways 211
Neostriatum, electroresponsive properties of isolated neurons 358
Nerve–muscle junction, sprouting and remodelling 251–291
Neuromuscular diseases, synaptic remodelling 273
Neurons, isolated, electroresponsive properties 351–372
  acetylcholine effects 365
  brain stem 362
  cerebellum 360
  dopamine effects 367
  hippocampus 352
  neocortex 356
  neostriatum 358
  noradrenaline effects 366
  spinal cord 364
  thalamus 359
Neuropeptide Y — somatostatin colocalisation in brain 69
Newborn infants, adenosine formation 329
Noradrenaline
  effect on hippocampal neurons 366
  role in kindling 7
Noradrenergic neurons, single unit recording in behaving animals 183–194
Nucleus accumbens, neuron response to odors 236
Nucleus ambiguus 104, 126
Nucleus retroambigualis respiratory neurons 105
  caudal 150
  early-burst inspiratory neurons 142
  late-peak inspiratory neurons 126
  post-inspiratory neurons 146
  rostral 126
Nucleus tractus solitarius 104, 107
  taste cells 294, 301, 305, 308
Nutrition-toxicity, taste 303

Obesity, fenfluramine 18, 29
Odor
  behaviour studies 214
  electrophysiology 217
Old world monkey, olfactory nervous system 195–250
Olfactory area, neocortex
  cat 244
  dog 242
  function of neurons 214
  monkey 198, 205
  rabbit 239
  rat 246
Olfactory behaviour tests 214
Olfactory bulb, neuron response to odors 228
Olfactory nerve pathways, neocortex 211
Olfactory nervous system, monkey 195–250
  behavioural studies 214
  comparison with lower mammals 239
  electrophysiological studies 217
  lateral hypothalamic area 234, 236
  neocortex 198
  olfactory nerve pathways 211
  thalamus 205
Opioids
  effect on CNS neurons 367
  role in fenfluramine anorexia 51
Orbitofrontal cortex
  neuron function 214
  olfactory area in 198, 207
  olfactory nerve pathways 211

Palatability 300
Parkinson's disease, somatostatin in brain 88
Pheochromocytoma surgery, effect of adenosine 334, 344
Pituitary, somatostatin receptors 75
Putuitary adenomas, role of somatostatin 86
Pituitary–adrenal axis, effect of fenfluramine 39
Plasticity of synaptic efficacy 275
Post-inspiratory neurons 146
Platelets, effect of adenosine 342, 344
Prepyriform cortex
  cell response to odors 231
  olfactory pathways 293
Pulmonary stretch receptors 116
Purines, quantitation 320
Purkinje cell, electroresponsive properties 360
Pyriform cortex, burst generating cells 3

Rabbit, olfactory area in neocortex 239
Reactive hyperemia, role of adenosine 328
Rebound excitation, respiratory neurons 130
Remodelling, synaptic 252, 262
Regular spiking cells, electroresponsive properties 357
Renal function, effect of adenosine 337
Respiratory disturbances, newborn, adenosine involvement 330
Respiratory rhythm 101
  Botzinger complex neurons 162
  nucleus retroambigualis neurons 126
  upper cervical respiratory neurons 168
  ventrolateral nucleus tractus solitarius neurons 107
Rostral nucleus retroambigualis 126

Satiety, receptors 308
Seasonal factors in synaptic remodelling 268
Seizure generation 1
Sensory stimuli, locus coeruleus neuron activity 186
Septum, neuron response to odors 235
Sick sinus syndrome, role of adenosine 336, 343
Sinus automaticity, role of adenosine 336, 343
Sleep, effect of fenfluramine 23
Sleep–wake cycle, locus coeruleus neuron activity 185
Smell discrimination, monkey 214
Sodium, consumption of 306
Somatostatin
  Alzheimer's disease and dementia 88
  anatomical distribution 66
  biosynthesis 64
  coexistence with other neurotransmitters 69
  Huntington's disease 87
  inactivation in brain 83
  mechanisms of action 78
  multiple effects 84
  pituitary adenomas 86
  receptors in brain and pituitary 75
  secretion and release 70
Spike-triggered averaging 160
Spinal cord
  electroresponsive properties of isolated neurons 364
  respiratory rhythm generator 106
Sprouting and remodelling at the nerve–muscle junction 251–291
Stomach, effects of fenfluramine 32
Substance P, effect on CNS neurons 367
Synapse formation 258
Synaptic efficacy, plasticity and regulation 275
Synaptic gutters, abandoned 253
Synaptic potentiation hypothesis of kindling 1
Synaptic remodelling 252
  effect of growth and age 265
  neuromuscular diseases 273
Synaptic transmission, measures of 275

Tachycardias, effect of adenosine 336, 343
Taste 293–317
  dimensions 300
  gustatory anatomy of the rodent 294
  gustatory neural code 296
  plasticity of responses 303
Tetrodotoxin, effect on hippocampal neurons 354, 357
Thalamus
  cell responses to odors 233
  electroresponsive properties of isolated neurons 359
  olfactory input to 205
  olfactory projection to prefrontal cortex 210
  transthalamic olfactory pathway 209
Theophylline, effect on adenosine levels in vascular beds 324
Thermogenesis, diet-induced 38
Thyroid hormones, somatostatin regulation 78
Tolerance to fenfluramine 24
Tongue 295
Toxicity, taste 301
Transmitters, action on electrical membrane properties of central neurons 365

Upper cervical respiratory neurons 167

Vasointestinal peptide, modulation of somatostatin release 72
Ventrolateral nucleus tractus solitarius respiratory neurons 104, 107
  afferents 113
  functional interrelations 112
  location and morphology 107
  patterns of activity 107
  projections and synaptic connections 121
Visual stimuli, locus coeruleus neuron activity 186

Water intake, effect of fenfluramine 22
Weight loss, fenfluramine 18, 26

Xylamidine 45